0059208

SAF-B00-054
100-NR-1 TSD Sites
R. A. Sampling – Soil
FINAL DATA PACKAGE

FAX RESULTS TO:

Rick Kerkow 372-8655 N/A
INITIAL/DATE

VERIFICATION OF CLIENT RECEIPT:

Phone or CC:Mail to Rick Kerkow N/A
INITIAL/DATE

COMPLETE COPY OF DATA PACKAGE TO:

Rick Kerkow X5-60 BL 2/20/03
INITIAL/DATE

Jeanette Duncan BL 2/20/03
INITIAL/DATE

COMMENTS: (PLEASE INCLUDE THE FOLLOWING ON THE FAX COVER SHEET)

SDG H2050 SAF-B00-054

Rad only Chem only X Rad & Chem

X Complete Partial

Waste Site: 116-N-1 Trench

RECEIVED
APR 2 8 2003
EDMC

EBERLINE SERVICES

February 15, 2003

Ms. Joan Kessner
Bechtel Hanford Inc.
3350 George Washington Way
Richland, WA 99352
MSIN: H0-25

Reference: **P.O. #630**
Eberline Services R3-01-100-7436, SDG H2050

Dear Ms. Kessner:

Enclosed is the data report for one solid sample designated under SAF No. B00-054 received at Eberline Services on January 21, 2003. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa Mannion

Melissa C. Mannion
Program Manager

MCM

Enclosure: Data Package

FEB 2003

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2050 was composed of one solid (soil) sample designated under SAF No. B00-054 with a Project Designation of: 100-NR-1 TSD Sites R.A. Sampling – Soil.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on February 7, 2003.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.5 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion — 2/15/3

Melissa C. Mannion
Program Manager

Date

E B E R L I N E S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP H2050

SDG	7436
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. 630
Case no	SDG_H2050

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

Prepared by

Reviewed by

Lab Id	EBERLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	02/07/03

SDG 7436
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2050

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab ID EBERLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/07/03

SDG 7436
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2050

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Lab ID EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

SAMPLE SUMMARY

SDG 7436
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2050

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
J00F37	116-N-1 Trench	SOLID		R301100-01	B00-054	B00-054-224	01/02/03 10:10
Method Blank		SOLID		R301100-03	B00-054		
Lab Control Sample		SOLID		R301100-02	B00-054		
Duplicate (R301100-01)	116-N-1 Trench	SOLID		R301100-04	B00-054		01/02/03 10:10

Lab ID EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

QC SUMMARY

SDG 7436
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2050

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7436	B00-054-224	J00F37	SOLID	90.8	1276 g		01/21/03	19	R301100-01	7436-001
		Method Blank	SOLID						R301100-03	7436-003
		Lab Control Sample	SOLID						R301100-02	7436-002
		Duplicate (R301100-01)	SOLID	90.8	1276 g		01/21/03	19	R301100-04	7436-004

Lab Id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

PREP BATCH SUMMARY

SDG 7436
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2050

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	7043-061	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7043-061	10.0	1			1	1	1/1		
Gas Proportional Counting												
93A	SOLID	Gross Alpha in Soil	7043-061	20.0	1			1	1	1/1		
93B	SOLID	Gross Beta in Soil	7043-061	15.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7043-061	15.0	1			1	1	1/1		
Liquid Scintillation Counting												
NI_L	SOLID	Nickel 63 in Soil	7043-061	10.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab ID EBRLNI
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

SDG 7436
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2050

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUFFIX	ANALYZED	REVIEWED	BY	METHOD
J00F37			R301100-01	7436-001	93A/93		01/28/03	01/30/03	MCM	Gross Alpha in Soil
116-N-1 Trench		SOLID	01/02/03	7436-001	93B/93		01/27/03	01/30/03	MCM	Gross Beta in Soil
B00-054-224	B00-054		01/21/03	7436-001	AM		01/30/03	02/07/03	MCM	Americium 241 in Soil
				7436-001	GAM		01/24/03	01/30/03	MCM	Gamma Scan
				7436-001	NI_L		02/01/03	02/07/03	MCM	Nickel 63 in Soil
				7436-001	SR		01/27/03	01/30/03	MCM	Total Strontium in Soil
Method Blank			R301100-03	7436-003	93A/93		01/27/03	01/30/03	MCM	Gross Alpha in Soil
		SOLID		7436-003	93B/93		01/27/03	01/30/03	MCM	Gross Beta in Soil
	B00-054			7436-003	AM		01/30/03	02/07/03	MCM	Americium 241 in Soil
				7436-003	GAM		01/28/03	01/30/03	MCM	Gamma Scan
				7436-003	NI_L		02/01/03	02/07/03	MCM	Nickel 63 in Soil
				7436-003	SR		01/27/03	01/30/03	MCM	Total Strontium in Soil
Lab Control Sample			R301100-02	7436-002	93A/93		01/28/03	01/30/03	MCM	Gross Alpha in Soil
		SOLID		7436-002	93B/93		01/27/03	01/30/03	MCM	Gross Beta in Soil
	B00-054			7436-002	AM		01/30/03	02/07/03	MCM	Americium 241 in Soil
				7436-002	GAM		01/28/03	01/30/03	MCM	Gamma Scan
				7436-002	NI_L		02/01/03	02/07/03	MCM	Nickel 63 in Soil
				7436-002	SR		01/27/03	01/30/03	MCM	Total Strontium in Soil
Duplicate (R301100-01)			R301100-04	7436-004	93A/93		01/28/03	01/30/03	MCM	Gross Alpha in Soil
116-N-1 Trench		SOLID	01/02/03	7436-004	93B/93		01/27/03	01/30/03	MCM	Gross Beta in Soil
	B00-054		01/21/03	7436-004	AM		01/31/03	02/07/03	MCM	Americium 241 in Soil
				7436-004	GAM		01/28/03	01/30/03	MCM	Gamma Scan
				7436-004	NI_L		02/01/03	02/07/03	MCM	Nickel 63 in Soil
				7436-004	SR		01/27/03	01/30/03	MCM	Total Strontium in Soil

Lab ID EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

SDG 7436
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2050

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
93A/93	B00-054	Gross Alpha in Soil	900.0_ALPHABETA_GPC	1			1	1	1	4
93B/93	B00-054	Gross Beta in Soil	900.0_ALPHABETA_GPC	1			1	1	1	4
AM	B00-054	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
GAM	B00-054	Gamma Scan	GAMMA_GS	1			1	1	1	4
NI_L	B00-054	Nickel 63 in Soil	NI63_LSC	1			1	1	1	4
SR	B00-054	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TOTALS				6			6	6	6	24

Lab ic EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2050

R301100-03 **Method Blank**

METHOD BLANK

SDG 7436 Client/Case no Hanford SDG H2050
Contact Melissa C. Mannion Contract No. 630

Lab sample id R301100-03 Client sample id Method Blank
Dept sample id 7436-003 Material/Matrix SOLID
SAF No B00-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.685	1.2	2.8	10	U	93A
Gross Beta	12587-47-2	0.023	3.3	5.6	15	U	93B
Nickel 63	13981-37-8	-0.049	2.6	4.5	30	U	NI_L
Total Strontium	SR-RAD	0.075	0.47	0.97	1.0	U	SR
Americium 241	14596-10-2	0.058	0.12	0.16	1.0	U	AM
Potassium 40	13966-00-2	U		0.21		U	GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	U		0.011	0.10	U	GAM
Radium 226	13982-63-3	U		0.019		U	GAM
Radium 228	15262-20-1	U		0.048		U	GAM
Europium 152	14683-23-9	U		0.026	0.10	U	GAM
Europium 154	15585-10-1	U		0.029	0.10	U	GAM
Europium 155	14391-16-3	U		0.030	0.10	U	GAM
Thorium 228	14274-82-9	U		0.014		U	GAM
Thorium 232	TH-232	U		0.048		U	GAM
Uranium 235	15117-96-1	U		0.042		U	GAM
Uranium 238	U-238	U		1.4		U	GAM
Americium 241	14596-10-2	U		0.060		U	GAM

100-NR-1 TSD Sites R.A. Sampling

QC-BLANK 43675

Lab id EBRLNI
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

R301100-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7436
Contact Melissa C. Mannion

Client/Case no Hanford SDG H2050
Contract No. 630

Lab sample id R301100-02
Dept sample id 7436-002

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B00-054

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	196	14	3.0	10		93A	200	8.0	98	68-132	70-130
Gross Beta	226	11	5.1	15		93B	212	8.5	107	74-126	70-130
Nickel 63	555	11	4.4	30		NI_L	570	23	97	84-116	80-120
Total Strontium	51.2	2.7	0.94	1.0		SR	53.0	2.1	97	83-117	80-120
Americium 241	47.2	2.0	0.14	1.0		AM	47.6	1.9	99	89-111	80-120
Cobalt 60	0.280	0.019	0.010	0.050		GAM	0.299	0.012	94	76-124	80-120
Cesium 137	0.293	0.018	0.012	0.10		GAM	0.303	0.012	97	76-124	80-120

100-NR-1 TSD Sites R.A. Sampling

QC-LCS 43674

Lab id EBRLNI
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

R301100-04 J00F37

DUPLICATE

SDG 7436 Client/Case no Hanford SDG H2050

Contact Melissa C. Mannion Contract No. 630

DUPLICATE	ORIGINAL	
Lab sample id R301100-04	Lab sample id R301100-01	Client sample id J00F37
Dept sample id 7436-004	Dept sample id 7436-001	Location/Matrix 116-N-1 Trench SOLID
	Received 01/21/03	Collected/Weight 01/02/03 10:10 1276 g
% solids 90.8	% solids 90.8	Custody/SAF No B00-054-224 B00-054

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALIFIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	19.2	4.8	3.6	10		93A	16.8	4.6	3.9		13	70
Gross Beta	3160	38	6.5	15		93B	3110	37	6.5		2	32
Nickel 63	12.1	3.0	4.5	30		NI_L	13.4	3.1	4.5		10	55
Total Strontium	107	3.9	1.1	1.0		SR	116	4.1	1.1		8	23
Americium 241	4.74	1.2	0.61	1.0		AM	6.42	0.53	0.14		30	37
Potassium 40	10.0	1.1	1.1			GAM	10.3	1.2	1.3		3	40
Cobalt 60	98.1	0.39	0.16	0.050		GAM	106	0.50	0.24		8	32
Cesium 137	2220	1.0	0.51	0.10		GAM	2320	2.0	0.72		4	32
Radium 226	U		0.69		U	GAM	U		0.76	U	-	
Radium 228	U		1.1		U	GAM	U		1.2	U	-	
Europium 152	U		1.5	0.10	U	GAM	U		1.6	U	-	
Europium 154	0.840	0.33	0.42	0.10		GAM	1.13	0.43	0.54		29	89
Europium 155	U		1.0	0.10	U	GAM	U		1.3	U	-	
Thorium 228	U		0.68		U	GAM	U		0.69	U	-	
Thorium 232	U		1.1		U	GAM	U		1.2	U	-	
Uranium 235	U		1.6		U	GAM	U		1.9	U	-	
Uranium 238	U		32		U	GAM	U		36	U	-	
Americium 241	U		3.1		U	GAM	U		3.0	U	-	

100-NR-1 TSD Sites R.A. Sampling

QC-DUP#1 43676

Lab id EBRLNI
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 02/07/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2050

R301100-01 **J00F37**

DATA SHEET

SDG	7436	Client/Case no	Hanford SDG H2050
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R301100-01	Client sample id	J00F37
Dept sample id	7436-001	Location/Matrix	116-N-1 Trench SOLID
Received	01/21/03	Collected/Weight	01/02/03 10:10 1276 g
% solids	90.8	Custody/SAF No	B00-054-224 B00-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	16.8	4.6	3.9	10		93A
Gross Beta	12587-47-2	3110	37	6.5	15		93B
Nickel 63	13981-37-8	13.4	3.1	4.5	30		NI_L
Total Strontium	SR-RAD	116	4.1	1.1	1.0		SR
Americium 241	14596-10-2	6.42	0.53	0.14	1.0		AM
Potassium 40	13966-00-2	10.3	1.2	1.3			GAM
Cobalt 60	10198-40-0	106	0.50	0.24	0.050		GAM
Cesium 137	10045-97-3	2320	2.0	0.72	0.10		GAM
Radium 226	13982-63-3	U		0.76		U	GAM
Radium 228	15262-20-1	U		1.2		U	GAM
Europium 152	14683-23-9	U		1.6	0.10	U	GAM
Europium 154	15585-10-1	1.13	0.43	0.54	0.10		GAM
Europium 155	14391-16-3	U		1.3	0.10	U	GAM
Thorium 228	14274-82-9	U		0.69		U	GAM
Thorium 232	TH-232	U		1.2		U	GAM
Uranium 235	15117-96-1	U		1.9		U	GAM
Uranium 238	U-238	U		36		U	GAM
Americium 241	14596-10-2	U		3.0		U	GAM

100-NR-1 TSD Sites R.A. Sampling

Lab id EBERLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

Test AM Matrix SOLID
SDG 7436
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2050

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 7043-061					
J00F37	R301100-01			7436-001	6.42
BLK (QC ID=43675)	R301100-03			7436-003	U
LCS (QC ID=43674)	R301100-02			7436-002	ok
Duplicate (R301100-01)	R301100-04			7436-004	ok
Nominal values and limits from method 100-NR-1 TSD Sites R.A. Sampling				RDLs (pCi/g)	1.0

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-061 2σ prep error 5.0 % Reference Lab Notebook 7043 pg. 061																
J00F37	R301100-01			0.14	0.200			80		905			28	01/30/03	01/30	SS-052
BLK (QC ID=43675)	R301100-03			0.16	0.200			52		854				01/30/03	01/30	SS-045
LCS (QC ID=43674)	R301100-02			0.14	0.200			67		867				01/30/03	01/30	SS-044
Duplicate (R301100-01) (QC ID=43676)	R301100-04			0.61	0.200			67		170			29	01/30/03	01/31	SS-041
Nominal values and limits from method				1.0	0.200			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_1E_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-963	Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 3
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.26 ± 0.46
YIELD 66 ± 23

Lab Id EBRLNL
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

Test SR Matrix SOLID
SDG 7436
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2050

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 7043-061					
J00F37	R301100-01			7436-001	116
BLK (QC ID=43675)	R301100-03			7436-003	U
LCS (QC ID=43674)	R301100-02			7436-002	ok
Duplicate (R301100-01)	R301100-04			7436-004	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0
100-NR-1 TSD Sites R.A. Sampling					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7043-061	2σ prep error 10.0 %			Reference Lab Notebook 7043 pg. 061												
J00F37	R301100-01			1.1	0.400			80		100			25	01/27/03	01/27	GRB-201
BLK (QC ID=43675)	R301100-03			0.97	0.400			73		100				01/27/03	01/27	GRB-224
LCS (QC ID=43674)	R301100-02			0.94	0.400			81		66				01/27/03	01/27	GRB-219
Duplicate (R301100-01) (QC ID=43676)	R301100-04			1.1	0.400			80		100			25	01/27/03	01/27	GRB-204
Nominal values and limits from method				1.0	0.400			30-105		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-502	Strontium in Solids, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES			
	MDA	1.0	± 0.17
	YIELD	78	± 7

Lab id EBRLNI
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

Test 93A Matrix SOLID
SDG 7436
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H2050

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha
Preparation batch 7043-061					
J00F37	R301100-01	93		7436-001	16.8
BLK (QC ID=43675)	R301100-03	93		7436-003	U
LCS (QC ID=43674)	R301100-02	93		7436-002	ok
Duplicate (R301100-01)	R301100-04	93		7436-004	ok
Nominal values and limits from method				RDLs (pCi/g)	10
100-NR-1 TSD Sites R.A. Sampling					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-061	2σ prep error 20.0 %							Reference Lab Notebook 7043 pg. 061								
J00F37	R301100-01	93		3.9	0.100			23	100				26	01/26/03	01/28	GRB-115
BLK (QC ID=43675)	R301100-03	93		2.8	0.100			21	100					01/26/03	01/27	GRB-102
LCS (QC ID=43674)	R301100-02	93		3.0	0.100			22	100					01/26/03	01/28	GRB-116
Duplicate (R301100-01) (QC ID=43676)	R301100-04	93		3.6	0.100			22	100				26	01/26/03	01/28	GRB-113
Nominal values and limits from method				10	0.100			5-250	100				180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-125	Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 3.3 ± 1.0
RESIDUE 22 ± 2

Lab id EBRLNI
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/07/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

Test 938 Matrix SOLID
SDG 7436
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H2050

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta
Preparation batch 7043-061					
J00F37	R301100-01	93		7436-001	3110
BLK (QC ID=43675)	R301100-03	93		7436-003	U
LCS (QC ID=43674)	R301100-02	93		7436-002	ok
Duplicate (R301100-01)	R301100-04	93		7436-004	ok
Nominal values and limits from method				RDLs (pCi/g)	15
100-NR-1 TSD Sites R.A. Sampling					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-061	2σ prep error 15.0 %			Reference Lab Notebook 7043 pg. 061												
J00F37	R301100-01	93		6.5	0.100			23		100			25	01/26/03	01/27	GRB-105
BLK (QC ID=43675)	R301100-03	93		5.6	0.100			21		100				01/26/03	01/27	GRB-102
LCS (QC ID=43674)	R301100-02	93		5.1	0.100			22		100				01/26/03	01/27	GRB-101
Duplicate (R301100-01) (QC ID=43676)	R301100-04	93		6.5	0.100			22		100			25	01/26/03	01/27	GRB-105
Nominal values and limits from method				15	0.100			5-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-125	Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 5.9 ± 1.4
RESIDUE 22 ± 2

Lab ID EBRLNL
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

Test GAM Matrix SOLID
SDG 7436
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2050

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 7043-061						
J00F37	R301100-01			7436-001	106	2320
BLK (QC ID=43675)	R301100-03			7436-003	U	U
LCS (QC ID=43674)	R301100-02			7436-002	ok	ok
Duplicate (R301100-01)	R301100-04			7436-004	ok	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.10
100-NR-1 TSD Sites R.A. Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7043-061 2σ prep error 15.0 % Reference Lab Notebook 7043 pg. 061																
J00F37	R301100-01			3.9	772					249			22	01/23/03	01/24	MB,05,00
BLK (QC ID=43675)	R301100-03			0.086	772					260				01/23/03	01/28	MB,05,00
LCS (QC ID=43674)	R301100-02			0.010	772					260				01/23/03	01/28	01,04,00
Duplicate (R301100-01) (QC ID=43676)	R301100-04			3.7	772					201			26	01/23/03	01/28	02,04,00
Nominal values and limits from method				0.050	772					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 4
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 1.9 ± 4.3
YIELD ____ ± ____

Lab ID EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2050

Test NI_L Matrix SOLID
SDG 7436
Contact Melissa C. Mannion

METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2050

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63
Preparation batch 7043-061					
J00F37	R301100-01			7436-001	13.4
BLK (QC ID=43675)	R301100-03			7436-003	U
LCS (QC ID=43674)	R301100-02			7436-002	ok
Duplicate (R301100-01)	R301100-04			7436-004	ok
Nominal values and limits from method				RDLs (pCi/g)	30
100-NR-1 TSD Sites R.A. Sampling					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7043-061	2σ prep error 10.0 %			Reference Lab Notebook 7043 pg. 061												
J00F37	R301100-01			4.5	0.200			97	100				30	01/31/03	02/01	LSC-005
BLK (QC ID=43675)	R301100-03			4.5	0.200			96	100					01/31/03	02/01	LSC-005
LCS (QC ID=43674)	R301100-02			4.4	0.200			97	100					01/31/03	02/01	LSC-005
Duplicate (R301100-01) (QC ID=43676)	R301100-04			4.5	0.200			95	100				30	01/31/03	02/01	LSC-005
Nominal values and limits from method				30	0.200			30-105	50				180			

PROCEDURES	REFERENCE	N163_LSC
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-431	Nickel-63 Purification, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	4.5	±	0.10
	YIELD	96	±	2

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SAMPLE DELIVERY GROUP H2050

SDG 7436
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2050

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2050

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

SDG 7436
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2050

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Lab ID EBERLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/07/03

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-054-224	Page 1 of 1
Collector RB Kerkow	**Company Contact** RB Kerkow **Telephone No.** 372-2187	**Project Coordinator** TRENT, SJ	**Price Code** **Data Turnaround**
Project Designation 100-NR-1 TSD Sites R. A. Sampling - Soil	**Sampling Location** 116-N-1 Trench H2050 (7436)	**SAF No.** B00-054	**Air Quality** ☐
Ice Chest No. ERC 01 025	**Field Logbook No.** EL 1524-3 **COA** R1301N2600	**Method of Shipment** FED EX	
Shipped To (TMA)/RECRA	**Offsite Property No.** RSR 107171	**Bill of Lading/Air Bill No.** N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

None

Preservation	None										
Type of Container	Marinelli										
No. of Container(s)	1										
Volume	500mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.								TIE TO RCF		PLUME 6
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**								
J00F37	SOIL	1-2-03	1010	X		RK 1/13/03			J00F25		6A-03
~~J00F38~~	~~SOIL~~										
~~J00F39~~	~~SOIL~~					RK 1/13/03					

CHAIN OF POSSESSION

Sign/Print Names			
Relinquished By/~~Removed~~ From: RB KERKOW/RB Kerkow — Date/Time: 1645 1-13-03	Received By/Stored In: REF 1A RBK — Date/Time: 1645 1-13-03
Relinquished By/Removed From: REF 1A 12003 — Date/Time: 1000	Received By/Stored In: SJGALE 12003 1000 — Date/Time:
Relinquished By/Removed From: SJGALE 12003 1000 — Date/Time:	Received By/Stored In: FED EX — Date/Time:
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: 1-13-03 9:30 — Date/Time:
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: — Date/Time:
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: — Date/Time:

SPECIAL INSTRUCTIONS

LAB COA: R1301N2F00

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Americium-241; Strontium-89,90 -- Total Sr; Gross Alpha; Gross Beta DELETE H_3 -TRITIUM, ISOTOPIC Pu, ISOTOPIC U. RK 1/13/03

ADD: Ni-63

ADD: HEX CHROME

RBK 1-13-03

Personnel not available to relinquish samples from the 3728 Ref # 1A on 1 12003

Matrix *

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

EBERLINE SERVICES **ANALYTICAL SERVICES GROUP**

Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT 1-21-03

Client: Bechtel Hanford Date/Time received 9:30

CoC No. B00-054-224

Container I.D. No. ERC-01025 Requested TAT (Days) _____ P.O. Received Yes [ ] No [ ]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [✓]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [✓]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [✓]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [✓]	No [ ]	N/A [ ]
5.	Packing material is:	Wet [ ]	Dry [✓]	
6.	Number of samples in shipping container: 1			
7.	Number of containers per sample: 1 (Or see CoC _____)			
8.	Paperwork agrees with samples?	Yes [ ]	No [ ]	
9.	Samples have: Tape [✓] Hazard labels [✓] Rad labels [✓] Appropriate sample labels [✓]			
10.	Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]			
11.	Describe any anomalies: _____			
13.	Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____			
14.	Received by [signature] Date: 1-21-03 Time: 1130			

Customer Sample No.	cpm	mr/hr	wipe	Customer Sample No.	cpm	mr/hr	wipe
J00537	115						

Ion Chamber Ser. No. 117 Calibration date _____

Alpha meter Ser. No. _____ Calibration date _____

Survey Meter Ser. No. _____ Calibration date _____

LIONVILLE LABORATORY INC.

3 February 2003

Joan Kessner
Bechtel-Hanford, Inc.
3190 Washington Way
MSIN H9-03
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0301L572
SDG #	H2050
SAF #	B00-054
Date Received	1-24-03
# Samples	1
Matrix	Soil
Volatiles	
Semivolatiles	
Pest/PCB	
DRO	
GRO	
Metals	
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

FEB 2003

r:\group\pm\orlette\tnu-hanford\data\b_ltrs.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

FEB 2003

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-054 H2050

DATE RECEIVED: 01/24/03 LVL LOT # :0301L572

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J00F37						
% SOLIDS	001	S	03L%S009	01/02/03	01/27/03	01/28/03
% SOLIDS	001 REP	S	03L%S009	01/02/03	01/27/03	01/28/03
CHROMIUM VI	001	S	03LVI007	01/02/03	01/30/03	01/31/03
CHROMIUM VI	001 REP	S	03LVI007	01/02/03	01/30/03	01/31/03
CHROMIUM VI	001 MS	S	03LVI007	01/02/03	01/30/03	01/31/03
CHROMIUM VI	001 MSD	S	03LVI007	01/02/03	01/30/03	01/31/03
LAB QC:						
CHROMIUM VI	MB1	S	03LVI007	N/A	01/30/03	01/31/03
CHROMIUM VI	MB1 BS	S	03LVI007	N/A	01/30/03	01/31/03
CHROMIUM VI	MB1 BSD	S	03LVI007	N/A	01/30/03	01/31/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B00-054 H2050
LVL#: 0301L572

W.O.#: 11343-606-001-9999-00
Date Received: 01-24-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blank for Chromium VI was within the method criteria.

6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.

7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.

8. The replicate analyses for Percent Solids and Chromium VI were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

01-31-03
Date

njp\i01-572

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 11 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	_√_ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__√__ 9081	__ c
Chromium VI		_√_ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	
Other:	**Method:**		
Other:	**Method**		

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/31/03

CLIENT: TNUHANFORD B00-054 H2050
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0301L572

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00F37	% Solids	94.6	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/31/03

CLIENT: TNUHANPORD B00-054 H2050 LVL LOT #: 0301L572

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LVI007-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/31/03

CLIENT: TNUHANFORD B00-054 H2050 LVL LOT #: 0301L572

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J00F37	Soluble Chromium VI	3.9	0.42u	4.2	86.1	1.0
		Insoluble Chromium VI	1410	0.42u	1260	111.5	100
BLANK10	03LVI007-MB1	Soluble Chromium VI	4.1	0.40u	4.0	103.7	1.0
		Insoluble Chromium VI	1210	0.40u	1190	101.9	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/31/03

CLIENT: TNUHANFORD B00-054 H2050 LVL LOT #: 0301L572

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J00F37	% Solids	94.6	94.2	0.36	1.0
		Chromium VI	0.42u	0.42u	NC	1.0

Lionville Laboratory Use Only
03016572

Custody Transfer Record/Lab Work Request

Page ___ of ___

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI LIONVILLE LABORATORY INC

Client: TNU Hanford B00-054

Est. Final Proj. Sampling Date: ___

Project #: 11343-606-001-9999-00

Project Contact/Phone #: ___

Lionville Laboratory Project Manager: OJ

QC: SPEC Del: STD TAT: 7 days

Date Rec'd: 1/24/03 Date Due: 1-31-03

Refrigerator #	5
#/Type Container – Liquid	
#/Type Container – Solid	1PL
Volume – Liquid	
Volume – Solid	250
Preservatives	

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN; HEX CHROME

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb				Metal	CN	HEX CHROME (ICRG)					
001	J00F37	/	/	S	1/2/03	1010										1					

Lionville Laboratory Use Only

Special Instructions: SAF # B00-054

DATE/REVISIONS:
1. 79.07g of sample sent
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	JPerry	1/24/03	1000

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 837295657651

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # See below
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample Y or (N)
4) Unbroken on Sample Y or (N)
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 6.8 °C

60

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-054-224	Page 1 of 1
Collector: RB Kerkow	Company Contact: RB Kerkow; Telephone No.: 372-2187	Project Coordinator: TRENT, SJ	Price Code; Data Turnaround
Project Designation: 100-NR-1 TSD Sites R. A. Sampling - Soil	Sampling Location: 116-N-1 Trench H2050 (7436)	SAF No.: B00-054	Air Quality ☐
Ice Chest No.: ERC 01 025	Field Logbook No.: EL 1524-3; COA: R1301N2600	Method of Shipment: FED EX	
Shipped To: (TMA)/RECRA	Offsite Property No.: RSR 107171	Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

None

Preservation	None											
Type of Container	Marinelli											
No. of Container(s)	1	1										
Volume	500mL	50g										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Cr VI	per Jean Kipanen, BHI 1/22/03 mcm					TIE TO RCF		plume 6		
Sample No.	Matrix *	Sample Date	Sample Time									
J00F37	SOIL	1-2-03	1010	X	X					J00F25		6A-03
J00F38	SOIL					RK 1/13/03						
J00F39	SOIL					RK 1/13/03						

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RB KERKOW/RB Kerkow	1-13-03 1645	REF 1A	1-13-03 1645
REF 1A 12003	1000	SJGALE 12003	1000
SJGALE 12003	1000	FED EX	
Fed EX			1-24-03 9:30
	1/23/03 1:30pm		
FedEX		Jerry (LVLE)	1/24/03 1000

SPECIAL INSTRUCTIONS

LAB COA: R1301N2P00

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Strontium-89,90 -- Total Sr; Gross Alpha; Gross Beta DELETE H3 -TRITIUM, ISOTOPIC Pu, ISOTOPIC U. RK 1/13/03

ADD: Ni-63

ADD: HEX CHROME

RBK 1-13-03

Personnel not available to relinquish samples from the 3728 Ref # 1A on 1 12 01 03

Matrix *: S=Soil; SE=Sediment; SO=Solid; SL=Sludge; W = Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

ENT: TNU Hanford

hase Order/Project:

DATE: 1/24/03

/ SOW# / Release #: B00-054

oratory SDG #: 0301L572

TE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3. Airbill # recorded? TRK# 8372 9565 7651	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5. Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6. Custody seals on sample containers intact, signed and dated?	☐ Yes	☑ No	☐ N/A	☑ see Comment # (1)
7. All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8. All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☐ Yes	☐ No	☑ N/A	☐ see Comment #
10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11. Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12. coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13. coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14. Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

ATI-SD 631 / 6.8°C
(no ice in cooler)

(1) No custody seal on sample

Laboratory Sample Custodian: JKerry 1/24/03 1000

Laboratory Project Manager: